

## ABSTRACT

An absorbing composition is described herein that includes at least one inorganic-based compound, at least one absorbing compound, and at least one material modification agent. In addition, methods of making an absorbing composition are also described that includes: a) combining at least one inorganic-based compound, at least one absorbing compound, at least one material modification agent, an acid/water mixture, and one or more solvents to form a reaction mixture; and b) allowing the reaction mixture to form the absorbing composition at room temperature. Another method of making an absorbing composition includes: a) combining at least one inorganic-based compound, at least one absorbing compound, at least one material modification agent, an acid/water mixture, and one or more solvents to form a reaction mixture; and b) heating the reaction mixture to form the absorbing composition. Yet another method of making an absorbing composition is described that includes: a) combining at least one inorganic-based compound, at least one absorbing compound, at least one material modification agent, and one or more solvents to form a reaction mixture, wherein the at least one material modification agent comprises at least one acid and water; and b) heating the reaction mixture to form an absorbing material, a coating or a film. In other methods of making an absorbing composition described herein, those methods include: a) combining at least one inorganic-based compound, at least one absorbing compound, at least one material modification agent, and one or more solvents to form a reaction mixture, wherein the at least one material modification agent comprises at least one acid and water; and b) allowing the reaction mixture to form an absorbing material, a coating or a film.